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10/749,293

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Xintian E. Lin

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EXAMINER

NGO, NGUYEN HOANG

ART UNIT

PAPER NUMBER

2473

MAIL DATE

DELIVERY MODE

02/23/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/749,293

**Applicant(s)**

LIN ET AL.

**Examiner**

NGUYEN NGO

**Art Unit**

2473

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/5/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 26 and 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

This communication is in response to the amendment of 11/5/2009. Accordingly, Claims 1-9, and 26-27 are currently pending in the application.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-3, 7-9, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alastalo et al. (US 2001/0047424), in view of Raghothaman et al. (US 20050111376), hereinafter referred to as Alastalo and Raghothaman.

**Regarding claim 1, 26,** Alastalo discloses a device, comprising:

a scheduler (access point scheduler for performing various timing operations, page 2 [0021]) in an access point (AP as seen from figure 1) to provide a schedule of packets to transmit to M stations (terminals are allocated simultaneous time slots of said frames, abstract and page 2 [0009] and page 3 [0030] and figure 7) during a time interval (time slot) by arranging variable length packets to fill each of the channels during the time interval based on the transmission times for different packet lengths of each of the variable length packets (the packets of the terminals to be served simultaneously are in the same order. Thus also the packet length is a criterion for selecting the terminals to be served simultaneously, page 7 [0058] and abstract). Examiner thus interprets the teachings of page 7 [0058] to mean that the length of the transmission (variable length packets) determines when to schedule a transmission to respective terminals in their respective time slots (time interval), thus correlating to arranging variable length packets (packet length criterion) to fill each of M spatial channels during a time interval (time slots for a respective terminal which are simultaneously transmitted) based on transmission times for different packet lengths (the different packet lengths will determine the transmission times for serving the terminals simultaneously).

Alastalo however fails to specifically disclose the limitation to transmit on each of M spatial channels by filling each of the M spatial channels, where M is a constant less than or equal to a number of antennas at the access point. Alastalo however discloses

that as the access point applies SDMA for example to  $M$  different terminals, the spatial signatures of the terminals are modified (page 3 [0030]) and that the access point uses a number of antenna elements,  $N$  (page 3 [0025] and page 1[0025]). Applicant further submits (see specification, page 4 lines 5-10) that conventional SDMA systems have the access point fill the  $M$  channels only using packets buffered for  $M$  stations (filling  $M$  spatial channels for traffic on  $M$  stations at a time instant). It would have therefore been obvious that Alastalo uses such a conventional SDMA system to fill  $M$  spatial channels for traffic on  $M$  stations at a time instant, since this technique is obviously well known in the art. Raghothaman further discloses that for a system utilizing antennas, the MIMO channel may be considered as a number of  $C$  independent channels, where  $C$  is less than or equal to the number of antennas and that each of the  $C$  channels is also referred to as a spatial subchannel ( $C$  corresponding to  $M$  spatial channels) of the overall MIMO channel (where  $M$  is a constant less than or equal to a number of antennas at the access point, page 1 [0003]). It would have thus been obvious to a person skilled in the art at the time the invention was made to incorporate the concept of having  $M$  be a constant less than or equal to a number of antennas at the access point as disclosed by Raghothamam, into method for arranging communication between terminals and an access point as disclosed by Alastalo, in order to efficiently and correctly arrange communications between an access point an a number of mobile stations.

**Regarding claim 2**, Alastalo discloses the device of claim 1 further including adaptive

antenna arrays used in conjunction with a beam forming algorithm to achieve spatial diversity and implement Spatial-Division Multiple-Access (SDMA), wherein the adaptive antenna array changes beam weights based on the schedule (access point applies SDMA for simultaneous transmission to M different terminals, page 1 [0002] and page 3 [0030]-[0036]).

**Regarding claim 3**, Alastalo discloses the device of claim 1 wherein the scheduler in the downlink provides the schedule of transmission intervals for different mobile stations (M different terminals, page 3 [0030] and abstract).

**Regarding claim 4**, Alastalo discloses the device of claim 1 wherein the schedule accounts for traffic information based on packet size (page 7 [0058]).

**Regarding claim 7, 8**, Alastalo discloses the device of claim 1 wherein the access point sends multiple schedules in a protected time interval to the mobile stations (method for arranging communication between terminals and an access point in a communication system applying data transmission frames which comprises downlink time slots for performing data transmission from the AP to the terminals, page 7 [0061]-[0062] and page 8 claim 1).

**Regarding claim 9**, Alastalo discloses the device of claim 1 wherein the access point

fills spatial channels using the data packets buffered for all the mobile stations (transmission data buffers, page 7 [0060]).

**Regarding claim 27**, Alastalo discloses the method of claim 26, further including: retrieving antenna resources in the access point to form spatial channels developed on the fly for a waiting mobile station (access point applies SDMA, page 3 [0030]-[0036]).

4. Claim 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alastalo et al. (US 2001/0047424), in view of Raghothaman et al. (US 20050111376), in view of Niwano (US 20070081498), hereinafter referred to as Alastalo, Raghothaman, and Niwano.

5. **Regarding claim 5, and 6**, Alastalo and Raghothaman fails to specifically disclose wherein the schedule accounts for traffic information to the mobile stations based on queue size/and priority. However it is well known in the art to base transmission schedules on such traffic information as queue size/and priority. Niwano discloses of such a concept as Niwano discloses of a base station and scheduler in which determines a schedule of a transmission timing at which the base station transmit packet data to mobile stations based on queue size and priority (page 3 [0049]). It would have thus been obvious to have the schedule account for traffic information as

disclosed by Niwano into the method and system for arranging communications between terminals and an access point as disclosed by the combination of Alastalo and Raghothaman, in order to efficiently and correctly transmit and schedule data transmissions from an access point to a terminal.

### ***Response to Arguments***

6. Applicant's arguments filed 11/5/2009 have been fully considered but they are not persuasive.

7. Applicant submits that the combination of Alastalo and Raghothaman fails to disclose or suggest a process of arranging variable length packets to fill each of the M spatial channels during time intervals based on the transmission times for different packet lengths of each of the variable length packets. Examiner however respectfully disagrees as Examiner uses Alastalo to disclose such a concept, as presented above. Alastalo discloses of the packets of the terminals to be served simultaneously are in the same order and that packet length is used as a criterion for selecting the terminals to be served simultaneously ([0058]). Thus Examiner interprets this to transmitting packets that are in the same order (same length) simultaneously during a point in time for its transmission. Examiner thus correlates this to arranging variable length packets based on transmission time for different packet lengths, as packets that are in the same order (same length) are served simultaneously (arranging of packets to be served in which is dependent on the packet length criterion thus different packet lengths will determine the transmission times for serving the terminals simultaneously). Applicant



has stated that Applicant has respectfully disagreed with such an interpretation, but has not presented any reasoning. Applicant further states that Alastalo explicitly discloses using packet length as a criterion for selecting terminals to be served simultaneously, thus Alastalo discloses of variable length packets, in which the length of the packet is used as a criterion to arrange when the variable length packets are filled in each of the channels during a time interval, in which is based on the times for different packet lengths as the length determines when to transmit a packet (based on time).

8. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGUYEN NGO whose telephone number is (571)272-8398. The examiner can normally be reached on Monday-Friday 7am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KWANG B. YAO/  
Supervisory Patent Examiner, Art Unit 2473

/N. N./

Examiner, Art Unit 2473